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IBM 1403 PRINTER MODIFICATIONS FOR COMPUTERIZED BRAILLE OUTPUT

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ABSTRACT

This report describes a standardized process for producing Braille computer output on an IBM 1403 line printer. A specific length of resilient rubber is stretched in front of the printer hammers to serve as a cushion for the penetration of characters into the paper. Rows of periods are printed, creating Braille characters on the reverse side of the paper.

I. DEVELOPMENT OF THE TECHNIQUE

In 1969 we began working with IBM's utility program* for the production of Braille on the 1401 line printer. IBM's suggestion of taping garter elastic across the hammers was tried, but produced results that were less than satisfactory. Several different types of cushions were tried, including multiple layers of paper and different thicknesses and layers of natural rubber, but we were unable to produce a good quality Braille with any degree of consistency. During this experimentation, removal of any ink buildup around the period on the print chain resulted in far more consistent quality.

The cushioning materials we found to be best suited to our needs were single strips of neoprene or polyurethane stretched to a specific tension in front of the printer hammers. Length variations of as little as 1/2 in. caused problems with the quality. If the rubber was too loose the strip would slip out of position when a page was ejected; if it was too tight, the rubber was pierced after only a few runs. Another problem was that the cushions often came loose during a run, causing a loss of both time and Braille output.

We then began to use IBM brackets for holding the rubber in place. However, the brackets did not solve all the problems. The rubber still had to be taped to the brackets or pierced over the end of the hook-shaped brackets. There was also the problem of relating to computer operations personnel exactly how tightly the rubber should be stretched.

We therefore decided to permanently attach a pair of clips to a rubber strip of the proper length and mount this on the IBM brackets. This solved the problem of installing the cushion with consistently proper tension. The clips also made positioning of the neoprene strip both easier and faster and eliminated the problem of rubber slippage during a run.

II. DESCRIPTION OF THE CUSHIONING STRIP

The strip we are presently using is a neoprene strip 9-1/2 in. long, 5/16 in. wide, and 1/32 in. thick. The overall length is slightly shorter after the strip is attached to the clips (Fig. 1a). The clips are made from electrical wire holddowns by bending the curved part of the holddown to secure a doubled end of rubber approximately 1/4 in. long within the crimp of the metal (Fig. 1b).

III. PROCEDURE FOR PRODUCING BRAILLE OUTPUT

A pair of the hook-like brackets that IBM offers must be installed on the line printer so that the strip can be mounted. The carriage control tape used is made for eight lines per inch and 80 lines per page. Printers that are in heavy use will probably have an ink buildup around the period. This buildup can be quickly removed by opening the print gate and swinging the ribbon shield out of the way to expose both ends of the print chain (Fig. 2). The chain should be advanced until a period slug appears at a convenient position. A dry cotton swab can then be used to remove the ink residue; no ink residue should be allowed to fall between the slugs of the chain. The residue can be wiped from each period. The number of period slugs will

*_Contributed Program Library_, IBM Operating System/360 Braille Utility Program 360D-01.0.005, p. 8.

vary slightly depending on the type of chain (PN, QN, etc.) in the printer. After the cleaning is completed, the ribbon shield can be swung back into position, leaving the print gate open.

The paper should then be removed from in front of the hammers and the Braille clips hooked onto the IBM hooks as shown in Fig. 3. Caution: If the clips are not positioned

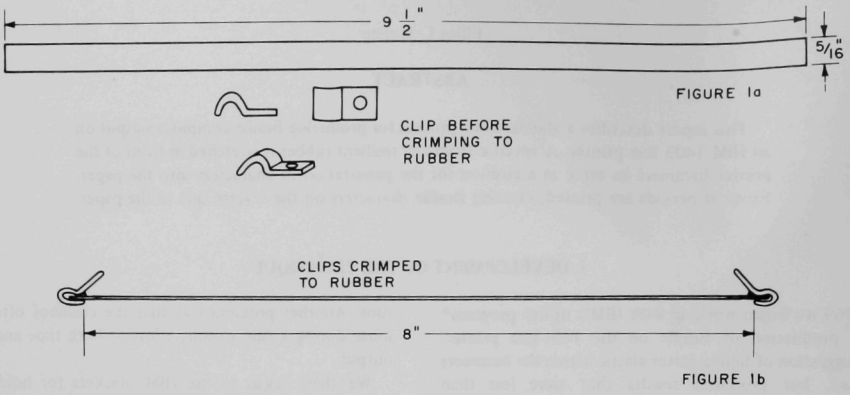

Fig. 1. Method of Attaching Holddown Clips to Neoprene Cushioning Strip

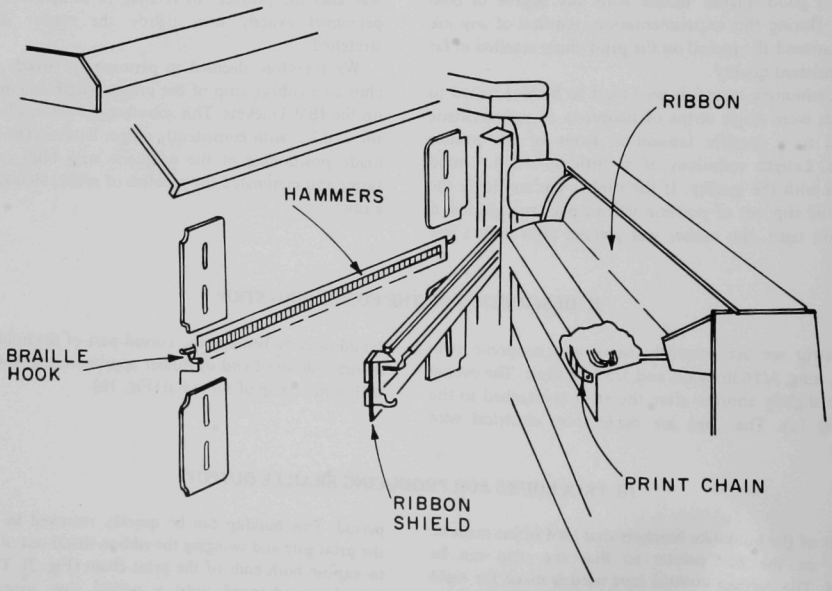

Fig. 2. View of Exposed Print Chain

correctly, they will come in contact with the print chain when the gate is closed.

Next the paper can be replaced and the print gate closed. The form's thickness should be set for the thinnest setting (0.003 on an IBM 1403), and the print density control set to the heaviest setting ("A" on the 1403).

The printer is now ready to produce Braille output. The most time-consuming part of the procedure is the cleaning of the periods, but with practice the entire printer setup will take less than five minutes.

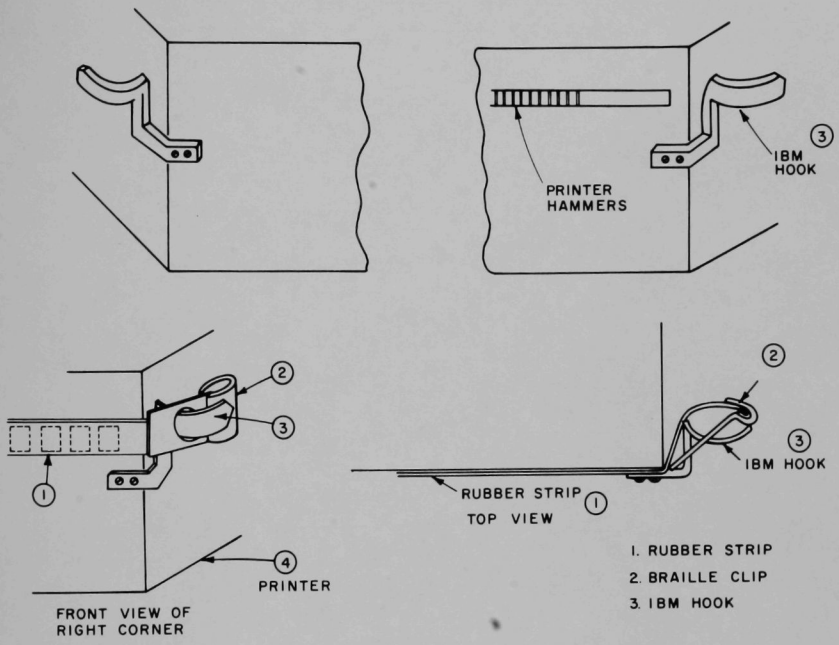

Fig. 3. Method of Attaching Cushioning Strip to IBM Braille Hooks

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